

**DEPARTMENT OF ENVIRONMENTAL QUALITY  
WATER QUALITY DIVISION  
MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM**

**Fact Sheet**

Permittee:	City of Conrad
Permit No.:	MT0020079
Receiving Water:	Unnamed tributary to Dry Fork of the Marias River
Facility Information:	Conrad Wastewater Treatment Plant
Mailing Address:	413 South Main Street Conrad, MT 59425
County:	Pondera
Contact:	David Zimbelman, Public Works Director
Fee Information:	
Type:	Minor Publicly Owned Treatment Works
Number of Outfalls:	1 (for fee determination purposes)
Type of Outfall:	001 – Facility Discharge

---

**I. Permit Status**

The Montana Pollutant Discharge Elimination System (MPDES) permit (permit) for the City of Conrad (City or Conrad) Wastewater Treatment Plant (WWTP) was issued on December 15, 2011, became effective on February 1, 2012, and had an expiration date of January 31, 2017. The Department of Environmental Quality (DEQ) received a complete permit renewal application from the City on July 22, 2016, and administratively extended the permit by letter dated August 19, 2016. The administratively extended permit is referenced in this Fact Sheet (FS) as the 2011-issued permit.

## II. Facility Information

### Current Facilities:

The Conrad WWTP serves the City of Conrad, with a current population of approximately 2,700 people. The WWTP is an extended aeration activated sludge plant completed in 2010. The treatment system consists of mechanical screening and grit removal, influent lift station, aeration basin, secondary clarifiers, aerated sludge digestion, sludge drying beds, and effluent disinfection with ultraviolet light (UV). A 350 kW, diesel generator provides emergency power to the WWTP. The average day design flow of the plant is 0.50 million gallons per day (mgd) and the maximum month design capacity is 0.65 mgd.

Discharge from the plant is continuous to an unnamed tributary to the Dry Fork of the Marias River at approximately 48°12'16" N latitude, 111°55'09" W longitude.

Table 1: Current Design Criteria Summary* – City of Conrad WWTP	
Facility Description: Activated sludge facility with effluent disinfection.	
Construction Date: 2010	Modification Date: NA
Design Population: 4,000	Current Population: 2,700
Design Flow, Average: 0.50 mgd	Design Flow, Maximum Month: 0.65 mgd
Design BOD Load: 840 lb/day	Design TSS Load: 1,040 lb/day
Collection System: Separate	
Disinfection: Yes	Type: Ultraviolet Light
Discharge Method: Continuous	

\*Information from O & M Manual dated May, 2011, Morrison-Maierle, Inc., and Department files.

Effluent data are summarized in Table 2. These data are based on the discharge monitoring reports (DMR) submitted by the City of Conrad WWTP for the period of record (POR) June 2013 through September 2017 [52 months].

In this FS, concentration levels of parameters are commonly expressed in terms of milligrams per liter (mg/L), micrograms per liter (µg/L), colony forming units per 100 milliliters (cfu/100ml) or number per 100 milliliters (#/100ml) and standard units (s.u.). In addition, the terms “30-day average” and “monthly average” are used interchangeably throughout the FS, as are the terms “7-day average” and “weekly average”.

Table 2: Effluent Characteristics for the POR June 2013 through September 2017

Parameter	Units	Previous Permit Limits	Minimum	Maximum	Average	Number of Samples <sup>9</sup>
Flow, Daily Average	mgd	-	0.122 <sup>1</sup>	0.225 <sup>1</sup>	0.165	52
5-Day Biochemical Oxygen Demand <sup>2</sup>	mg/L	30/45	1	7	2	52
Total Suspended Solids <sup>2</sup>	mg/L	30/45	0	8	1	52
pH <sup>3</sup>	s.u.	6.0 – 9.0	6.5	8.1	-	52
<i>Escherichia coli</i> <sup>2,4</sup>	cfu/100ml	126/252	1	426	3	32
<i>Escherichia coli</i> <sup>2,5</sup>	cfu/100ml	630/1,260	1	8	2	20
Total Ammonia, as N <sup>6</sup>	mg/L	4.3/6.2	0	1.8	0.2	52
Kjeldahl Nitrogen, as N	mg/L	-	2.5	3.9	2.9	9 <sup>10</sup>
Nitrate + Nitrite, as N <sup>7</sup>	mg/L	10	1.13	9.80	3.83	52
Total Nitrogen, as N	mg/L	-	4.6	7.5	6.0	9 <sup>10</sup>
Total Phosphorus, as P	mg/L	-	0.04	2.97	0.63	9 <sup>10</sup>
Temperature	°C	-	7.5	17.7	12.6	52
Oil & Grease (O&G) <sup>8</sup>	mg/L	10	0	0	0	52
Dissolved Oxygen	mg/L	-	1.9	3.7	3.2	10
Whole Effluent Toxicity, Acute	Pass/Fail	-	pass	pass	pass	18

Footnotes:

1. Minimum & maximum flows are from the 30-day average flows reported.
2. 30-day average/7-day average limits. Carbonaceous BOD<sub>5</sub> (CBOD<sub>5</sub>) values reported rather than BOD<sub>5</sub>. NSS equivalent CBOD<sub>5</sub> levels are 25/40 mg/L.
3. Minimum & maximum reported each month.
4. Geometric mean rather than average for *E. coli*. Limits effective April 1 through October 31.
5. Geometric mean rather than average for *E. coli*. Limits effective November 1 through March 31.
6. 30-day average/maximum day limits.
7. Maximum day limit, effective November 30, 2016.
8. Maximum day limit.
9. Number of samples is the number of monthly DMRs submitted. For the parameters BOD<sub>5</sub>, TSS, pH, T & *E. coli*, which were required to be sampled at least weekly, the actual number of individual samples analyzed could exceed 204 over the POR.
10. Kjeldahl N, Total N and Total P values are from the 2<sup>nd</sup> and 3<sup>rd</sup> quarter DMRs only to cover the effective period for nutrient water quality standards (June 16-September 30) in DEQ-12A.

Generally speaking, as shown on Table 2, the Conrad WWTP completed in 2010 is operated very well and produces a very high quality effluent. In the 52-month POR, the only effluent limits exceeded were for *E. coli*. The warm weather effluent limit on *E. coli* was exceeded in May 2017 for both the 30-day average and the 7-day average and in June 2017 for the 7-day average. The effluent limit exceedences for *E. coli* were a result of UV malfunction and the issues were promptly corrected.

### III. Technology-based Effluent Limits

#### a. Applicability to Technology-based Limits

The Montana Board of Environmental Review, in ARM 17.30.1203, adopted by reference 40 Code of Federal Regulations (CFR) 133 which defines minimum treatment requirements for secondary treatment, or the equivalent, for publicly owned treatment works (POTW). Secondary treatment is defined in terms of effluent quality as measured by five-day biochemical oxygen demand (BOD<sub>5</sub>) or alternatively, five-day carbonaceous biochemical oxygen demand (CBOD<sub>5</sub>), total suspended solids (TSS), percent removal of BOD<sub>5</sub> (or CBOD<sub>5</sub>) and TSS, and pH.

These requirements may be modified on a case-by-case basis for facilities that are eligible for treatment equivalent to secondary treatment (TES) or alternative state requirements (ASR) for TSS. To determine if a facility is eligible for TES the facility must meet the requirements summarized as follows:

- 1) The BOD<sub>5</sub> and TSS effluent concentrations consistently achievable through proper operation and maintenance of the treatment works exceed the minimum effluent quality described for secondary treatment,
- 2) The treatment works utilize a trickling filter or waste stabilization pond, and
- 3) The treatment works utilize biological treatment that consistently achieves a 30-day average of at least 65 % removal.

The technology-based effluent limits (TBELs) in the 2011-issued permit are based on the national secondary treatment standards (NSS) for BOD<sub>5</sub>, TSS and pH. The 2011-issued permit also includes mass limits plus 85 % percent removal requirements for both BOD<sub>5</sub> and TSS.

Proposed TBEL-based effluent limits are shown on Table 3. The BOD<sub>5</sub> limit will be expressed as CBOD<sub>5</sub> because of permittee preference. The CBOD<sub>5</sub>, TSS and pH limits remain NSS, including the requirement for 85 % removal of CBOD<sub>5</sub> and TSS. Mass limits for both CBOD<sub>5</sub> and TSS are included in accordance with ARM 17.30.1345(8)(a) and are based on design flow.

#### Mass Limit Calculations:

Load (lb/day) = Design Flow (mgd) x Concentration Limit (mg/L) x 8.34 lb/gal

CBOD<sub>5</sub>:      30-day Ave:    Load = (0.50)(25)(8.34) = 104.2 = 104 lb/day  
                    7-day Ave:    Load = (0.50)(40)(8.34) = 166.8 = 167 lb/day

TSS:            30-day Ave:    Load = (0.50)(30)(8.34) = 125.1 = 125 lb/day  
                    7-day Ave:    Load = (0.50)(45)(8.34) = 187.6 = 188 lb/day

Table 3: Technology-based Effluent Limits				
Parameter	Units	30-Day Average	7-Day Average	Rationale
CBOD <sub>5</sub>	mg/L	25	40	40 CFR 133.102(a)
	lb/day	104	167	
	% removal	85 %	-	
TSS	mg/L	30	45	40 CFR 133.102(b)
	lb/day	125	188	
	% removal	85 %	-	
pH	s.u.	6.0-9.0 (instantaneous)		40 CFR 133.102(c)

b. Nondegradation Allocated Loads

Nondegradation allocated loads for the Conrad WWTP were determined for BOD<sub>5</sub> and TSS under a previous permitting action and documented in a Statement of Basis (SOB) dated June 13, 2005.

Table 4 summarizes the nondegradation allocated loads (BOD<sub>5</sub> load expressed as equivalent CBOD<sub>5</sub> load) and the actual calculated average loads discharged from the facility for calendar years 2014, 2015 and 2016. The data show that the facility did not exceed the nondegradation allocated loads for BOD<sub>5</sub> (expressed as CBOD<sub>5</sub>) and TSS.

Table 4: Comparison of Allocated Nondegradation Loads & Actual Loads				
Parameter	Allocated Load	Actual Load*		
	(lb/day)	2014	2015	2016
CBOD <sub>5</sub>	135	2.8	1.2	1.7
TSS	542	0.5	0.4	0.4

\*Actual loads are based on annual averages of the monthly values reported on DMRs.

#### IV. Water Quality-based Effluent Limits

##### a. Scope and Authority

Permits are required to include water quality-based effluent limits (WQBELs) when TBELs are not adequate to prevent excursions of state water quality standards (40 CFR 122.44 and ARM 17.30.1344). ARM 17.30.637(2) states that no wastes may be discharged that can reasonably be expected to violate any state water quality standards. Montana water quality standards (ARM 17.30.601, *et.seq.*) define both water use classifications for all state waters and numeric and narrative standards that protect those designated uses.

##### b. Receiving Water

The Conrad WWTP discharges treated effluent to an unnamed tributary to the Dry Fork of the Marias at a point located approximately two miles upstream from the confluence with the Dry Fork of the Marias. In this FS the receiving water will be referenced hereafter as the unnamed tributary.

In 2006 – 2008, DEQ conducted a Use Attainability Analysis (UAA) to determine if the use classification of the unnamed tributary was correct. DEQ found that the unnamed tributary is a perennial stream but that it cannot support a salmonid fishery because of natural high temperatures and determined that the appropriate use classification is B-3. Further, DEQ found that the unnamed tributary periodically has no flow in the area of Outfall 001. Waters classified B-3 are to be maintained suitable for drinking, culinary, and food processing purposes, after conventional treatment; bathing, swimming, and recreation; growth and marginal propagation of non-salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply [ARM 17.30.625(1)].

The unnamed tributary where it receives the discharge from the Conrad WWTP is located within the Marias River watershed identified as United States Geological Survey (USGS) Hydrological Unit Code (HUC) 10030203 and Montana assessment unit MT41P002\_010 (Dry Fork Marias River). The unnamed tributary is not listed as impaired on the 2016 303(d) list. The Dry Fork of the Marias at the confluence with the unnamed tributary is also not listed on the 2016 303(d) list as impaired for any beneficial uses.

There are no gaging stations on the unnamed tributary. However, the unnamed tributary is reported to have no flow at times in the vicinity of the discharge from the Conrad WWTP; therefore, the 7-day, 10-year low flow (7Q10) and the 14-day, 5-year low flow (14Q5) of the unnamed tributary are both zero.

##### c. Water Quality Standards

Discharges to surface waters classified B-3 are subject to the specific water quality standards of ARM 17.30.625, Circular DEQ-7 (DEQ-7), and the general provisions of ARM 17.30.635 through 637. Discharges are also subject to ARM 17.30 Subchapter 5 (Mixing Zones) and



Subchapter 7 (Nondegradation of Water Quality), and Circular DEQ-12A (Montana Base Numeric Nutrient Standards).

d. Mixing Zone

A mixing zone is an area where effluent mixes with the receiving water and certain water quality standards may be exceeded. The permittee was not allowed a mixing zone in the 2011-issued permit and all effluent limitations were applied at the end of the discharge pipe. No mixing zone was allowed because of the lack of continuous flow of the receiving water, i.e. the unnamed tributary. Receiving water conditions remain unchanged and no mixing zone will be granted for this permit renewal. Effluent limits developed for this renewal will apply at the end of pipe.

The discharge must comply with the general prohibitions of ARM 17.30.637(1) which requires that state waters, including mixing zones, must be free from substances which will:

- (a) settle to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines;
- (b) create floating debris, scum, a visible oil film (or be present in concentrations at or in excess of 10 milligrams per liter) or globules of grease or other floating materials;
- (c) produce odors, colors, or other conditions as to which create a nuisance or render undesirable tastes to fish flesh or make fish inedible;
- (d) create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life; and
- (e) create conditions which produce undesirable aquatic life.

e. Basis for WQBELs (Reasonable Potential and Calculations)

Permits are required to include WQBELs when TBELs are not adequate to protect water quality standards and no wastes may be discharged that can reasonably be expected to violate any standard. The need for WQBELs is determined based on reasonable potential (RP) calculations for certain pollutants to determine if numeric or narrative water quality standards may be exceeded. DEQ uses a mass balance equation (*Equation 1*) to determine reasonable potential based on the *EPA Technical Support Document for Water Quality-based Toxics Control* (TSD) and DEQ-7.

$$C_{RP} = \frac{C_E Q_E + C_S Q_S}{Q_E + Q_S} \quad (\text{Equation 1})$$

Where:

- $C_{RP}$  = receiving water concentration (RWC) after mixing, mg/L
- $C_E$  = effluent concentration, mg/L
- $C_S$  = RWC concentration upstream of discharge, mg/L
- $Q_S$  = applicable receiving water flow, mgd
- $Q_E$  = facility design flow rate, mgd

Pollutants typically present in treated effluent from municipal wastewater treatment facilities that may cause or contribute to exceedences of water quality standards include conventional

pollutants such as biological material (measured by BOD<sub>5</sub> or CBOD<sub>5</sub>), TSS, oil & grease (O & G), *Escherichia coli* (*E. coli*) bacteria and pH; non-conventional pollutants such as total residual chlorine (TRC), total ammonia nitrogen (ammonia), nitrate + nitrite nitrogen (NO<sub>3</sub>/NO<sub>2</sub>), total nitrogen (TN) and total phosphorus (TP).

Although the unnamed tributary is known to experience periods of no flow in the vicinity of the discharge from the Conrad WWTP, a marginal fishery of non-salmonids has been shown to exist in the receiving water, at least below the old lagoon discharge location, some 3,000 feet downstream from Outfall 001. The continuous discharge from the Conrad WWTP wets the receiving water drainage some distance down gradient, but the extent is unknown and likely varies with the seasons.

#### 1. Conventional Pollutants

TSS, CBOD<sub>5</sub>, and pH – The facility provides a significant reduction in biological material and solids through NSS for CBOD<sub>5</sub>, TSS and pH as addressed in Section III. No additional WQBELs will be necessary for these parameters. Sampling frequency for influent and effluent CBOD<sub>5</sub> and TSS and effluent pH will be continued at once per week.

O & G – The 2011-issued permit has a daily maximum limit of 10 mg/L for O & G, along with monthly monitoring requirements. Monitoring over the POR showed that levels of O & G in the effluent were typically not detected at laboratory reporting levels and it is unlikely that RP would exist. Accordingly, the limit on O & G will not be continued in the renewed permit. However, quarterly monitoring for O & G will be required.

*E. coli* – The 2011-issued permit included a monthly average limit for *E. coli* of 126 cfu/100 mL and a weekly average limit for *E. coli* of 252 cfu/100 mL, effective April 1 through October 31; and a monthly average limit for *E. coli* of 630 cfu/100 mL and a weekly average limit for *E. coli* of 1,260 cfu/100 mL, effective November 1 through March 31.

The water quality standards for the unnamed tributary for *E. coli* are:

- April 1 through October 31, of each year, the geometric mean number of *E. coli* may not exceed 126 colony forming units (cfu) per 100 mL and 10% of the total samples may not exceed 252 cfu per 100 mL during any 30-day period [ARM 17.30.625(2)(a)(i)]; and
- November 1 through March 31, of each year, the geometric mean number of *E. coli* may not exceed 630 cfu per 100 mL and 10% of the samples may not exceed 1,260 cfu per 100 mL during any 30-day period [ARM 17.30.625(2)(a)(ii)].

The effluent limits on *E. coli* of the 2011-issued permit will be retained in the renewed permit, as will the monitoring frequency of once per week.



## 2. Non-conventional Pollutants

TRC – The 2011-issued permit did not include effluent limits for TRC because chlorination was not used for disinfection of the effluent. UV effluent disinfection was installed in 2010. TRC limits and monitoring will not be included in the renewed permit.

Ammonia – The 2011-issued permit contains ammonia limits of 4.3 mg/L (average monthly limit) and 6.2 mg/L (maximum daily limit). Ammonia limits are developed based on standards that account for a combination of pH and temperature of the receiving stream, the presence or absence of salmonid fishes (trout, whitefish and salmon), and the presence or absence of fish in early life stages. Water quality standards for ammonia and the resultant effluent limits are determined on a year-round basis, rather than on a seasonal basis. The ammonia limits for the discharge from the Conrad WWTP were developed in accordance with TSD procedures and discussed in detail in the SOB dated July, 2011 for the 2011-issued permit.

The effluent limits on ammonia of the 2011-issued permit will be retained in the renewed permit, as will the monitoring frequency of once per month. As shown on Table 2, the Conrad WWTP does an excellent job removing ammonia, with effluent ammonia levels averaging 0.2 mg/L over the 52-month POR, with a maximum reported level of 1.8 mg/L. The permittee will have no difficulties meeting the ammonia limits of the renewed permit with continued good operation of the WWTP.

NO<sub>3</sub>/NO<sub>2</sub> - The 2011-issued permit contains a maximum daily effluent limit of 10 mg/L on NO<sub>3</sub>/NO<sub>2</sub>, effective November 30, 2016. The human health water quality standards for NO<sub>3</sub>/NO<sub>2</sub> in waters classified B-3 is 10 mg/L. In addition, DEQ-7 specifies that no samples in surface water or groundwater may exceed this standard. The NO<sub>3</sub>/NO<sub>2</sub> limit for the discharge from the Conrad WWTP were developed in accordance with TSD procedures and discussed in detail in the SOB dated July, 2011 for the 2011-issued permit.

The effluent limit on NO<sub>3</sub>/NO<sub>2</sub> of the 2011-issued permit will be retained in the renewed permit, as will the monitoring frequency of once per month. As shown on Table 2, the Conrad WWTP does an excellent job removing NO<sub>3</sub>/NO<sub>2</sub>, with effluent levels averaging 3.83 mg/L over the 52-month POR, with a maximum reported level of 9.80 mg/L. The permittee will have no difficulties meeting the NO<sub>3</sub>/NO<sub>2</sub> limits of the renewed permit with continued good operation of the WWTP.

TN & TP – As discussed previously, neither the unnamed tributary nor the Dry Fork of the Marias where the unnamed tributary joins are listed as impaired on the 2016 303(d) list for any beneficial uses.

Numeric water quality standards for TN and TP have been adopted in Circular DEQ-12A (DEQ-12A) for the unnamed tributary and Dry Fork of the Marias in the Conrad area, which is in Level III Northwestern Glaciated Plains and Level IV North Central Brown Glaciated Plains Ecoregions. The numeric water quality standards for TN and TP are 1,300 µg/L and 110 µg/L, respectively, both effective June 16 to September 30. Critical stream-flow for application of the standards and for determining RP is the seasonal (July-October) 14Q5 low flow. As discussed previously, the 14Q5

of the unnamed tributary is zero. DEQ flow measurements taken in 2006 as part of the UAA confirmed that the unnamed tributary upstream from the Conrad WWTP had very low flow in July and no flow in months of August, September and October. Accordingly, no dilution is available for use in calculation of RP for either TN or TP.

The average seasonal (June-September) TN and TP effluent values from the Conrad WWTP over the POR are 6.0 mg/L and 0.63 mg/L, respectively, based on only the quarterly samples taken in June and September (9 samples total). The maximum reported effluent seasonal TN and TP values for the POR are 7.5 mg/L and 2.97 mg/L, respectively. However, operation of the WWTP for removal of TN and TP improved over the POR and the quality of the effluent discharged seasonally in 2015, 2016 and 2017 was considerably better than the quality of the effluent discharged seasonally in 2013 and 2014, especially with respect to TP. The average seasonal TN and TP values for the 2015-2017 period are 6.2 mg/L and 0.10 mg/L, respectively. The maximum reported effluent seasonal TN and TP values for the 2015-2017 period are 7.5 mg/L and 0.18 mg/L, respectively.

With no dilution allowed, RP exists to exceed the water quality standards for both TN and TP in the receiving water as a result of the discharge from the WWTP, regardless of which monitoring period is used. Accordingly, the City has applied for a general nutrient standards variance for the discharge from the Conrad WWTP as allowed in DEQ-12B. However, although the Conrad WWTP is not capable of meeting the water quality standards for nutrients with its effluent, and therefore eligible for a variance, the WWTP is capable of producing an effluent that is of higher quality than the applicable general variance end-of-pipe treatment requirements of Table 12B-1 of DEQ-12B.

DEQ-12B provides that mechanical plants that are capable of producing effluent TN and TP levels of higher quality than the general variances adopted in Table 12B-1 on July 1, 2017 shall be required to meet effluent load limits that reflect the treatment capability of the WWTP. These load limits are considered general variance limits for the WWTP capable of producing an effluent of higher quality than the general variances of Table 12B-1. General variance load limits for TN and TP in discharges from WWTPs capable of producing a higher quality effluent than the Table 12B-1 levels are calculated based on application of a TSD multiplier, derived from Table 5-2 for a coefficient of variation (CV) of 0.6, to the long term average (LTA) TN and TP concentrations, then expressed as an average monthly load at the design average flow (Q) of the WWTP. From Table 5-2, for a CV of 0.6, the TSD multiplier is 1.55. Accordingly, the Conrad WWTP, for LTA concentrations of TN and TP from the 2015-2017 period, TSD multipliers of 1.55, and a Q of 0.5 mgd; the average monthly load general variance limits for TN and TP are 40.0 lbs/day and 0.67 lbs/day, respectively. Based on the TN and TP loads reported on DMRs during the June through September months of 2015-2017, the Conrad WWTP will have no difficulties complying with the general variance load limits with continued good operation.

In addition to the general variance TN and TP limits, the Permittee will be required to develop a pollutant minimization program (PMP) for mechanical plants in accordance with Section 2.2 of DEQ-12B.

TN and TP monitoring will be required on a monthly basis during the months June, July, August and September only – rather than the quarterly year-round monitoring in the 2011-issued permit.

Dissolved Oxygen (DO) – Freshwater aquatic life standards are characterized by the fishery (cold- or warm-water) and by the presence or absence of fish early life stages. Standards are further defined based on a time frame and required DO levels. B-3 waterbody classification states the receiving waters are to be maintained for growth and propagation of non-salmonid fishes and associated aquatic life. DO standards for B-3 waters are given in Table 5.

Table 5: B-3 Water Classification Dissolved Oxygen Standards				
Dissolved Oxygen	30-Day Mean (mg/L)	7-Day Mean (mg/L)	7-Day Mean Minimum <sup>(1)</sup> (mg/L)	1-Day Minimum <sup>(1)</sup> (mg/L)
Early Life Stages <sup>(2)</sup>	NA	6.0	NA	5.0
Other Life Stages	5.5	NA	4.0	3.0
Footnotes: “NA” means “Not Applicable”. 1. All minima should be considered as instantaneous concentrations to be achieved at all times. 2. Includes all embryonic and larval stages and all juvenile forms of fish to 30-days following hatching.				

The unnamed tributary upstream from the Conrad WWTP typically has no flow in the months of August, September and October and therefore does not support a viable salmonid fishery and likely no non-salmonid fishery in the vicinity of the discharge from the Conrad WWTP. In addition, no background DO data exist for the unnamed tributary during months where flows are likely. No basis exists for imposition of effluent DO limits at this time.

### 3. Toxic Pollutants

Metals – No effluent data for metals was submitted with NPDES Application Form 2A for permit renewal and no industrial dischargers to the municipal wastewater collection system have been reported. No effluent limits on metals will be included in this permit.

Whole Effluent Toxicity (WET) Testing – ARM 17.30.637(1)(d) requires that state water be free from substances attributable to municipal waste that create conditions which are harmful or toxic to human, animal, plant or aquatic life, except DEQ may allow limited toxicity in a mixing zone provided that there is no acute lethality to organisms. The 2011-issued permit for the Conrad WWTP had quarterly WET testing requirements (using both *Ceriodaphnia dubia* and *Pimephales promelas*) and no test failures were reported. Since no WET test failures occurred during the POR and the Conrad WWTP is a minor WWTP with no reported significant industrial dischargers, WET testing will not be required this permit cycle.

## V. Final Effluent Limits

Beginning on the effective date of the permit and lasting through the term of the permit, the quality of effluent discharged by the facility through Outfall 001 shall, as a minimum, meet the limitations as set forth below:

Table 6: Final Effluent Limits				
Parameter	Units	Average Monthly Limit <sup>1</sup>	Average Weekly Limit <sup>1</sup>	Maximum Daily Limit
5-Day Carbonaceous Biochemical Oxygen Demand (CBOD <sub>5</sub> )	mg/L	25	40	--
	lbs/day	104	167	--
CBOD <sub>5</sub> , Removal	%	85	--	--
Total Suspended Solids (TSS)	mg/L	30	45	--
	lbs/day	125	188	--
TSS, Removal	%	85	--	--
<i>Escherichia coli</i> ( <i>E. coli</i> ) <sup>2, 4</sup>	#/100ml	126	252	--
<i>Escherichia coli</i> ( <i>E. coli</i> ) <sup>3, 4</sup>	#/100ml	630	1,260	--
Total Ammonia Nitrogen	mg/L	4.3	--	6.2
Nitrate + Nitrite, as N	mg/L	--	--	10
Total Nitrogen, as N <sup>5</sup>	lbs/day	40.0	--	--
Total Phosphorus, as P <sup>5</sup>	lbs/day	0.67	--	--
pH	s.u.	6.0-9.0 (instantaneous) <sup>6</sup>		
Footnotes:				
1 See Part I.C of permit and Definition section at end of permit for explanation of terms.				
2. This limitation applies from April 1 through October 31.				
3. This limitation applies from November 1 through March 31.				
4. Report Geometric Mean if more than one sample is collected in the reporting period.				
5. This limit applies from June 16 through September 30.				
6. For compliance purposes, any single analysis and/or measurement beyond this limit shall be considered a violation of the conditions of this permit.				

There shall be no discharge of floating solids or visible foam in other than trace amounts and there shall be no discharge which causes visible oil sheen in the receiving stream.

## VI. Self-Monitoring & Other Requirements

### a. Self-Monitoring

Effluent flow measurements are taken from the effluent manhole. Effluent samples for all parameters must be obtained immediately after treated wastewater flows through the UV



disinfection system from the downstream transition box. Influent samples for CBOD<sub>5</sub> and TSS are to be taken from the influent manhole.

Table 7: Monitoring and Reporting Requirements

Parameter	Unit	Sample Location	Sample Frequency	Sample Type <sup>1</sup>	Reporting Requirements	ML <sup>2</sup>
Flow	mgd	Effluent	Continuous	<sup>3</sup>	Ave Day & Max Month	0.001
5-Day Carbonaceous Biochemical Oxygen Demand (CBOD <sub>5</sub> )	mg/L	Influent	1/Week	Composite	Ave Month	10
	mg/L	Effluent	1/Week	Grab	Ave Month & Max Week	2
	% Removal <sup>4</sup>	NA	1/Month	Calculated	Ave Month	0.1
	lb/day	Effluent	1/Month	Calculated	Ave Month & Max Week	0.1
Total Suspended Solids (TSS)	mg/L	Influent	1/Week	Composite	Ave Month	10
	mg/L	Effluent	1/Week	Grab	Ave Month & Max Week	10
	% Removal <sup>4</sup>	NA	1/Month	Calculated	Ave Month	0.1
	lb/day	Effluent	1/Month	Calculated	Ave Month & Max Week	1
pH	s.u.	Effluent	1/Week	Instantaneous	Min & Max	0.1
<i>Escherichia coli</i>	#/100ml	Effluent	1/Week	Grab	Geo Mean & Max Week	1
Oil and Grease	mg/L	Effluent	1/Quarter	Grab	Ave Month	1
Total Ammonia as N	mg/L	Effluent	1/Month	Grab	Ave Month	0.07
Nitrate + Nitrite as N	mg/L	Effluent	1/Month	Grab	Max Day	0.02
Total Nitrogen as N <sup>5</sup>	mg/L	Effluent	1/Month	Calculated	Ave Month	0.2
Total Nitrogen as N <sup>5</sup>	lb/day	Effluent	1/Month	Calculated	Ave Month	0.1
Total Phosphorus as P <sup>5</sup>	mg/L	Effluent	1/Month	Grab	Ave Month	0.03
Total Phosphorus as P <sup>5</sup>	lb/day	Effluent	1/Month	Calculated	Ave Month	0.01
Dissolved Oxygen	mg/L	Effluent	1/Month	Grab	Ave Month	0.1

Footnotes:

1. See Definition section at end of permit for explanation of terms.
2. ML is the minimum detection level. Analyses for all parameters must be to the ML listed in the permit for the parameter.
3. Requires recording device or totalizer.
4. See narrative discussion in Part I of permit for additional details.
5. Monitoring for TN and TP required June 16 through September 30 only. TN is calculated as the sum of nitrate + nitrite (as N) Plus total kjeldahl nitrogen (as N) concentrations.



b. Sludge Requirements

This permit will contain standard conditions requiring compliance with 40 CFR 503 for any removal or disposal of biosolids from the Conrad WWTP.

c. Pretreatment Program

The facility is not currently operating under the EPA Pretreatment Program. The permit will include standard language restricting introducing certain pollutants to the Conrad WWTP and requiring the facility to provide adequate notice to the DEQ if a new source, volume or character of industrial pollutant is introduced to the system.

## VII. Nonsignificance Determination

The facility must meet 2011-issued permit final limits for BOD<sub>5</sub>, TSS, *E. coli*, pH, NO<sub>3</sub>/NO<sub>2</sub>, and total ammonia. The 2011-issued permit limits for BOD<sub>5</sub> are expressed in the renewed permit as equivalent limits on CBOD<sub>5</sub>. New permit limits have been imposed on TN and TP, effective immediately, that reflect the treatment capabilities of the WWTP in accordance with DEQ-12B. The discharge does not constitute a new or increased source of pollutants pursuant to ARM 17.30.702(18). Therefore, a nonsignificance analysis is not required (ARM 17.30.705).

## VIII. Special Conditions

a. Pollutant Minimization Program

A pollutant minimization program (PMP) is a structured set of activities designed to improve processes and pollutant controls that will prevent and reduce pollutant loadings. The PMP is required for two reasons: 1) Conrad needs and is eligible for a General Variance from the Montana Base Numeric Nutrient Standards found in DEQ-12A. 2) Conrad has met highest attainable conditions in Table 12B-1 of DEQ-12B for total nitrogen and total phosphorus. Conrad is required to adopt and implement a PMP reflecting the greatest pollutant reduction achievable.

The following PMP action items will be required of Conrad:

### Action Item 1: Continue Current Advanced Operational Strategies

1. Continue cycling aeration on and off in the bioreactor and in the aerobic digester throughout the permit term.
2. Throughout the permit term and in the operation and maintenance manual, continue to maintain in progress documentation of following operational strategies effective toward reducing nutrients, as applicable:
  - identification of aerators and mixers used or taken offline
  - aeration cycle times
  - oxygen reduction potential (ORP) target points
  - variable frequency drive set points

- target mixed liquor suspended solids (MLSS) concentration for summer and winter
- return and wasting strategies
- seasonal adjustments

**Action Item 2: Evaluate Nutrient Reduction Measures**

1. Submit a brief (no more than one-page) annual report addressing the following:
  - Identify nutrient reduction measures implemented that year.
  - Evaluate the effectiveness of each implemented nutrient reduction measure.
  - Propose nutrient reduction measures for the upcoming year that may include, if applicable, pollutant control measures beyond the ones listed in Action Item 1.

The annual reports will be due January 28<sup>th</sup> of each year, beginning January 28, 2020.

**IX. Public Participation**

a. Public Notice

In accordance with ARM 17.30.1372, DEQ issued Public Notice No. MT-18-19 dated September 7, 2018. The public notice states that a tentative decision has been made to issue an MPDES permit to the Permittee and that a draft permit, fact sheet and environmental assessment (EA) have been prepared. Public comments are invited any time prior to the close of the business on October 10, 2018. Comments may be directed to:

Department of Environmental Quality  
Water Protection Bureau  
PO Box 200901  
Helena, MT 59620

or

DEQWPBPublicComments@mt.gov

All comments received or postmarked prior to the close of the public comment period will be considered in the formulation of the final permit. DEQ will respond to all substantive comments and issue a final decision within sixty days of the close of the public comment period or as soon as possible thereafter.

All persons, including the applicant, who believe any condition of a draft permit is inappropriate or that DEQ's tentative decision to deny an application, terminate a permit, or prepare a draft permit is inappropriate, shall raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period (including any public hearing) under ARM 17.30.1372.

b. Notification of Interested Parties

Copies of the public notice were mailed to the discharger, state and federal agencies and interested persons who have expressed an interest in being notified of permit actions. A copy of the distribution list is available in the administrative record for this permit. In addition to mailing

the public notice, a copy of the notice and applicable draft permit, fact sheet and EA were posted on DEQ's website for 30 days.

Any person interested in being placed on the mailing list for information regarding this MPDES permit should contact DEQ, reference this facility, and provide a name, address, and email address.

c. Public Hearing

During the public comment period provided by the notice, DEQ will accept requests for a public hearing. A request for a public hearing must be in writing and must state the nature of the issue proposed to be raised in the hearing (ARM 17.30.1373).

d. Permit Appeal

After the close of the public comment period DEQ will issue a final permit decision. A final permit decision means a final decision to issue, deny, modify, revoke and reissue, or, terminate a permit. A permit decision is effective 30 days after the date of issuance unless a later date is specified in the decision, a stay is granted pursuant to ARM 17.30.1379, or the applicant files an appeal pursuant to 75-5-403, MCA.

The Applicant may file an appeal within 30 days of DEQ's action to the following address:

Secretary, Board of Environmental Review  
Department of Environmental Quality  
1520 East Sixth Avenue  
PO Box 200901  
Helena, Montana 59620-0901

e. Additional Information

Requests for additional information or questions regarding this permit should be directed to the Water Protection Bureau at (406) 444-5546.

**X. Information Sources**

- a. Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. §§ 1251-1387, October 18, 1972, as amended 1973-1983, 1987, 1988, 1990-1992, 1994, 1995 and 1996.
- b. US Code of Federal Regulations, 40 CFR Parts 122-125, 130-133, & 136.
- c. Montana Code Annotated (MCA), Title 75-5-101, *et seq.*, "Montana Water Quality Act," 2011.
- d. Administrative Rules of Montana Title 17 Chapter 30 - Water Quality
  - Subchapter 2 - Water Quality Permit and Application Fees.
  - Subchapter 5 - Mixing Zones in Surface and Ground Water.
  - Subchapter 6 - Montana Surface Water Quality Standards and Procedures.
  - Subchapter 7- Nondegradation of Water Quality.

Subchapter 12 - Montana Pollutant Discharge Elimination System (MPDES)  
Standards.

Subchapter 13 - MPDES Permits.

- e. Montana Department of Environmental Quality Circular DEQ-7, Montana Numeric Water Quality Standards, October 2012.
- f. Integrated 303(d)/305(b) Water Quality Report for Montana (2016).
- g. McCarthy, P.M., 2016, Streamflow Characteristics Based On Data Through Water Year 2009 For Selected Streamflow Gaging Stations In Or Near Montana: U.S. Geological Survey Scientific Investigations Report 2015-5019-E, XX.
- h. US EPA Technical Support Document for Water Quality-Based Toxics Control, EPA/505/2-90-001, March 1991.
- i. US EPA National Pollutant Discharge Elimination System (NPDES) Permit Writers' Manual, EPA 833-K-10-001, September 2010.
- j. MPDES Permit Number MT0020079:
  - 1. Administrative Record.
  - 2. Renewal Application DEQ Form 1 and EPA Form 2A, July 2016.
  - 3. Additional Requested Information, December 2017.
- k. Montana DEQ Circular DEQ-12A, Montana Base Nutrient Standards, July 2014.
- l. Montana DEQ Circular DEQ-12B, Nutrient Standards Variances, June 2017.
- m. Morrison Maierle, Inc., Conrad Wastewater Treatment Plant Upgrades, Record Drawings, August 2010.